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10/563,281

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Tsutomu Igaki

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EXAMINER

SUMMONS, BARBARA

ART UNIT

PAPER NUMBER

2817

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/563,281

Applicant(s)

IGAKI ET AL.

Examiner

BARBARA SUMMONS

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-8 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

New Grounds of Claim Objections

1. Claim 1 is objected to because of the following informalities:

In claim 1, on line 7, note that "four interdigital electrodes" should be changed to

- - four interdigital transducer electrodes - - (see lines 3-4).

Appropriate correction is required.

New Grounds of Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-4, 6-8 and 10-12 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the feature "the at least four interdigital transducer electrodes" on lines 2-3 thereof, these being either "arranged on the second surface acoustic wave propagation path" or "of the second electrode pattern" (emphasis added), wherein this feature lacks antecedent basis in the claims, because the second propagation path and second electrode pattern were previously recited to have "a plurality of interdigital transducer electrodes" (see claim 1, lines 8-9). Therefore, the claim is unclear whether the second propagation path or second electrode pattern has "a plurality of" or "at least four" interdigital transducer electrodes (see also correctly worded claim 3). Note that no

embodiment has been shown (see figures) that has at least four interdigital transducer electrodes in the second pattern/propagation path i.e., the parallel resonator electrodes.

Claim 1 similarly recites the feature "the at least four interdigital transducer electrodes" when referring to the second electrode pattern (see lines 12-13) which lacks antecedent basis in the claim (see claim 1, lines 8-9) and renders the claim unclear as to how many interdigital transducer electrodes are in the second electrode pattern.

In any art rejections that may follow, the Examiner will consider the broader feature "a plurality of" interdigital transducers in the second electrode pattern/propagation path to read on the claims.

Each of claims 4, 10 and 11 recite "the plural interdigital transducer electrodes" when referring to the "first surface acoustic wave propagation path", wherein it was previously recited in claim 1 that the first path has "at least four" interdigital transducer electrodes. This renders the claims unclear as to how many of the "at least four" interdigital transducers is being referred to by the subsequently recited "the plural" interdigital transducers.

In any art rejections that may follow, the Examiner will consider any two of "the at least four" interdigital transducer electrodes having the recited features of claims 4, 10 and 11, to meet "the plural" interdigital transducer electrodes of the first surface acoustic wave propagation path recited therein. Clarification is required.

4. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-4, 6-8 and 10-12 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It is not described in the original specification that a surface acoustic wave filter having a first electrode pattern with "at least four interdigital transducer electrodes" (see claim 1, lines 3-4) that are "connected in series by connecting wirings" (see claim 1, lines 14-15) also provides that "the connecting wirings are arranged between the first electrode pattern and the second electrode pattern" (claim 1, lines 20-21). For example, Figs. 4, 6A, 6B and 10 all show connecting wirings 66, 94 and 95 that are NOT "arranged between" the first and second electrode patterns. Consequently, it appears that Applicants have amended the claims to include subject matter which can be construed as new matter.

However, it Applicants disagree that the above noted subject matter is "new matter", then Applicants are required to provide an explanation as to why these features should not be considered "new matter", as well as providing the location(s) in the original specification where there is support for the subject matter in question.

Withdrawn Claim Rejections - 35 USC §§ 102 and 103

6. Applicants' amendment and arguments received 05/05/2008 have overcome all of the prior rejections based on the Morimoto and Davenport references, and they have therefore been withdrawn.

New Grounds of Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 2, 4, 6, 8 and 10-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bauer et al. WO 03/081773 (of record) taken alone.

Note that that in the description below the Examiner will point to U.S. 7,304,553 (also of record) which is an English language translation of the WO document.

Regarding claims 1 and 2, Fig. 20 of Bauer et al. discloses a surface acoustic wave (SAW) ladder filter comprising: a piezoelectric substrate (not shown but see e.g. col. 8, lines 29-32); a first electrode pattern arranged on a first SAW propagation path (upper in the figure) and having at least four interdigital transducer (IDT) electrodes IS1-IS4; reflector electrodes RS1 and RS2 arranged at both ends of the first electrode pattern; a second electrode pattern with a plurality of four IDT electrodes IP1-IP4 on a

second SAW propagation path (lower in the figure); reflector electrodes RP1 and RP2 at both ends of the second electrode pattern to form a SAW resonator (see col. 3, lines 31-48); the at least four IDT electrodes IS1-IS4 being connected in series by connecting wirings as shown in Fig. 20 (see also col. 3, lines 12-18) are also acoustically coupled; each of the plurality of IDT electrodes IP1-IP4 on the second SAW propagation path is connected between the connecting wirings and ground (see col. 5, lines 51-55); the connecting wirings being arranged between the first and second electrode patterns in the same fashion as Applicants' Fig. 4; and wherein it is disclosed that the acoustic coupling between the IDTs in the first electrode pattern is provided by one of the methods listed at col. 4, lines 4-15 including an inner reflector/partially transmissive reflector that inherently has a fewer number of electrode fingers than the reflectors RS1 and RS2 providing total reflection at the ends of the propagation path (see col. 3, lines 43-45 and col. 4, lines 7 and 16-22).

Regarding claims 4, 8, 10 and 11, the adjacent acoustically coupled IDT electrodes can be arranged with the same phase or with reversed phases (see col. 4, lines 14-15 and 29-34). Regarding new claim 12, note that the choice of acoustically coupling with a reflector as in option a) at col. 4, lines 4-7 or via phase difference as in option e) at col. 4, lines 14-16 indicate an either/or situation wherein the IDTs are in phase and use an inner reflector (see also Fig. 13C) or the IDTs are provided with no reflector and a reverse phase (see Fig. 13A and col. 12, lines 29-36).

However, Bauer does not explicitly disclose using the combination of an inner partially transmissive reflector between two adjacent ones of the four IDT electrodes

IS1-IS4 and having another two adjacent ones of the four IDT electrodes with no reflector therebetween, or explicitly disclose the inner reflector connected to ground.

Regarding claim 6, the Examiner Takes Official Notice that it would have been extremely well known in the SAW filter art to connect reflectors to ground since they are either connected to a reference potential/ground or floated either of which would have also been an art recognized alternative to the other as evidenced by other art of record (see Wu JP 2002-016470 and the second paragraph of the rejection paragraph 9. of the prior Office action).

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Bauer (Fig. 20), if even necessary, by having provided an inner reflector between two adjacent ones of the electrically and acoustically coupled IDT electrodes IS1-IS4 and not provide a reflector between another two adjacent IDT electrodes, because Bauer explicitly suggests using a partially transmissive reflector between adjacent IDT electrodes to adjust the acoustic coupling (see Fig. 13C and col. 4, lines 4-7) or to alternatively provide adjustment of the acoustic coupling by providing the IDT electrodes be directly adjacent with a phase difference between them but no reflector between them (see Fig. 13A, col. 12, lines 29-36 and col. 4, lines 14-16), which would have also suggested to one of ordinary skill in the art that it would have been obvious to try combinations of the two methods in filters with more than two acoustically and electrically coupled IDT electrodes, and because Bauer explicitly states that all possible embodiments have not been shown and suggests using combinations of "circuiting arrangements with different transitions

between acoustically coupled interdigital transducers" (see col. 15, lines 4-10). Note that it would have been equally obvious to ground the inner reflector as this would have been merely one of the well known standard connections of reflectors in the SAW filter art or an art recognized alternative to floating the reflector.

9. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bauer et al WO 03/081773 (of record) in view of Penunuri et al. U.S. 5,638,036 (of record).

Bauer Fig. 20 discloses the invention as discussed above except for disclosing the series connection of the IDT electrodes of the series resonators IS1-IS4 being made by the inner partially transmissive reflector (see e.g. Fig. 13C) between adjacent acoustically coupled IDT electrodes.

Penunuri et al. discloses that it would have been known to use a reflector 313 (see Fig. 3) to connect the IDTs 304 and 322 of series resonators 305 and 320 in a ladder filter (see also col. 6, lines 64-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW ladder filter of Bauer (Fig. 20) with acoustically and electrically coupled series IDT electrodes IS1-IS4 by having provided the electrical series connection of the series resonators via a shared inner reflector (see e.g. Fig. 13C), because as noted above, Bauer is silent as to the connection of the shared reflector, thereby suggesting to one of ordinary skill that any connection such as using it to make the electrical series connection between the IDT electrodes of the series resonators, as explicitly suggested by the exemplary teaching thereof by Penunuri (Fig. 3 and col. 6, lines 64-67), would have been usable therewith.

Response to Arguments

10. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BARBARA SUMMONS whose telephone number is (571)272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs
August 4, 2008

/Barbara Summons/
Primary Examiner, Art Unit 2817